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PR82/030

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PROSPECTS & LEADS IN PERMITS OP 175/178

OF THE AMADEUS BASIN, N.T.

PR 82/30

DISCUSSION

Enclosed with this report are the following:

1. A regional time map for the Top Pacoota Structures at 1:250,000 scale;
2. Top Pacoota Time Structure Map for the Undandita Prospect at 1:50,000 scale;
3. Two seismic sections over the Undandita Prospect, lines P81-U2 and P82-U16.

The regional map identifies prospects and leads based on seismic control and outcrop mapping.

Leads and prospects to the east of 132°E, are interpreted to have only gas bearing potential. Most are Arumbera Sandstone tests, with the exception of South Waterhouse and Gosses Bluff prospects. The latter have Pacoota objectives, but based on source rock studies and depth of burial histories, must be considered to be gas objectives also.

Mapped prospects and leads between 132°E and 131°E are considered to have the best oil bearing potential. The West Walker#1 is currently being drilled to test a Pacoota Sandstone oil objective at 1388 m, and a high risk pre Cambrian gas target at 2718 metres.

The Undandita prospect is a possible oil test of a shallow Pacoota Sandstone objective. This prospect is discussed in further detail below.

Other high-lighted leads are fault related traps along trend from surface mapped anticlines. The north west Gardiner and Tempe Vale leads were identified by regional seismic and have recently had more detailed seismic control acquired over them. Four way closure cannot be identified on any of these leads, as they are interpreted as shallow Pacoota, oil tests relying on up-dip sealing faults to entrap hydrocarbon. The stratigraphic, geochemical data, and hydrocarbon shows from Stairway Sandstone in the Mt. Winter#1 well, coupled with seismic data, have demonstrated this area to be oil prospective.

West of Mt. Winter 1, the hydrocarbon bearing potential of the Cambro-Ordovician rocks is unknown, but regional stratigraphic knowledge tends to downgrade this area. Numerous fault related leads have been identified. The Johnstone lead and Gypsum Nose were detailed with infill, seismic program to define possible drilling targets. Both these leads are interpreted to encounter the Pacoota formation at between 1000-1500 metres.

THE UNDANDITA PROSPECT

The 1:50,000 Top Pacoota time structure map and seismic lines P81-U2 and P82-U16 are attached.

The Undandita Prospect is part of a fault related anticlinal complex 17.5 kilometres due north of Gardiner Anticline and 41 kilometres west of Gosses Bluff. Seismic data quality north and south of the prospect is good. However along the crest of the structure data quality deteriorates due to the complex nature of the anticline, and severe surface problems which inhibit penetration of the seismic energy. This is a characteristic which Undandita has in common with many of the leads in OP178.

The nearest well control that can be tied to Undandita, is Tyler#1, where the well was terminated in the Stairway Sandstone, above the Pacoota objective. Seismic control around Tyler #1 is single fold, 1966 vintage but tends to be of good quality. The Top Pacoota and deeper horizons on the seismic section rely on character correlation with areas to the west, and must be viewed with some caution.

Reference to the Undandita structure map shows that the prospect lies along trend from an anticline that is breached down to Pacoota Sandstone. Interpretation of the seismic data has indicated that this outcropping Pacoota Sandstone is separated from the Undandita prospect by a low angle thrust fault that soles out in the Cambrian Chandler Salt Unit. The prospect has dual objectives on the hanging and footwalls of the fault. The shallow target has a higher risk of flushing and breaching but both the foot and hanging wall Pacoota objectives are interpreted to be tested by a well located at SP 280 on P82-U16.

The footwall objective is encouraging in that it does not have to rely on an up-dip fault seal. Lines P82-U16 and P81-U2 show that four way closure exists.

The prospect is on trend with the Goyder Pass Diapir. Bitter Springs salt movement at Goyder pass has been documented to have been from early Cambrian to Ordovician. Subsequently it was uplifted with the Alice Springs Orogeny.

In Undandita, Cambro-Ordovician growth is evident from the seismic data. Both the Bitter Springs and Chandler Salt thicken into the prospect. Loss of section between the Top Mereenie Sandstone and Top Pacoota Sandstone horizons exposes the prospect to the possible loss of the Horn Valley Siltstone seal over the crest.

The thickening of the Chandler Salt interval indicates a discordance between the two principal, Pacoota and Arumbera reservoirs. Consequently a closed Pacoota Sandstone target will not overlie a closed Arumbera Sandstone objective at Undandita. Technically, it cannot be recommended that an Undandita well be drilled beyond the Pacoota objective, because of the prohibitive depth of 4,000 metres to the Arumbera objective.

The Pacoota Sandstone reaches a crest at .58 seconds on line P82-U16. Based on seismic velocities, the depth to the footwall objective is 1150 metres (KB).

CONCLUSION

From interpretation of the available seismic data it has become apparent that Permits OP175 and 178 are unlikely to have many other prospects that are of the size and simplicity of Mereenie, Dingo, Palm Valley and similar anticlinal features. In contrast, many small, fault related prospects and leads have been indicated by current seismic control.

A great many leads are in areas that flank outcrop exposures of the Pacoota Sandstone reservoir. The outcrops not only cause a deterioration of seismic data quality but also increase the risk that the reservoir will be flushed.

These risks have to be weighed against the cost of drilling expensive conventional holes to relatively shallow depths, when for similar costs a larger number of cheaper slim holes can be drilled to better evaluate the type of plays that are now envisaged to exist in the permit.